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NARAC Fact Sheet

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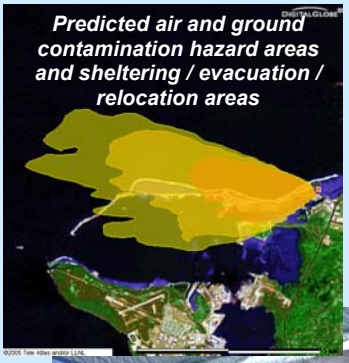
Disclaimer

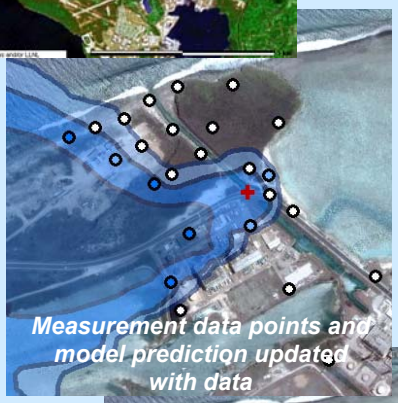
This work performed under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under Contract DE-AC52-07NA27344.

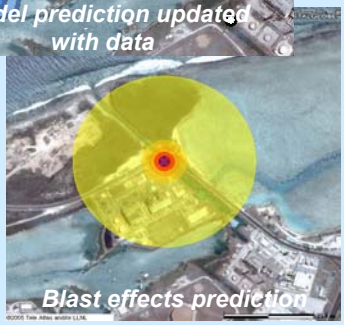
Lawrence Livermore National Laboratory

NARAC

National Atmospheric Release Advisory Center







NARAC / IMAAC provide key information to decision makers:

- *Airborne and ground contamination hazard areas*
- *Affected populations*
- *Expected health effects*
- *Protective action guides (such as for sheltering, evacuation)*
- *Geographical information*
- *Refined predictions and analyses based on field data*

OVERVIEW

The National Atmospheric Release Advisory Center (NARAC) provides critical information during hazardous airborne releases, as part of an integrated national preparedness and response strategy. Located at Lawrence Livermore National Laboratory (LLNL), NARAC provides tools and expert services to map the spread of hazardous material accidentally or intentionally released into the atmosphere. NARAC predictions provide information on affected areas and populations, potential casualties, health effects, and protective action guides to assist decision makers and responders. Center staff conduct research, develop new technologies, perform risk assessments, and provide real-time emergency response support for nuclear, radiological, chemical, biological or natural releases.

On April 15, 2004, the Homeland Security Council designated NARAC as the interim provider of capabilities for the DHS-led Interagency Modeling and Atmospheric Assessment Center (IMAAC). Under the National Response Plan (NRP) Notice of Change May 2006, the IMAAC's mission is to serve as the "single point for the coordination and dissemination of Federal dispersion modeling and hazard prediction products that represent the Federal position during actual or potential incidents requiring federal coordination", including Incidents of National Significance.

SUPPORTED AGENCIES

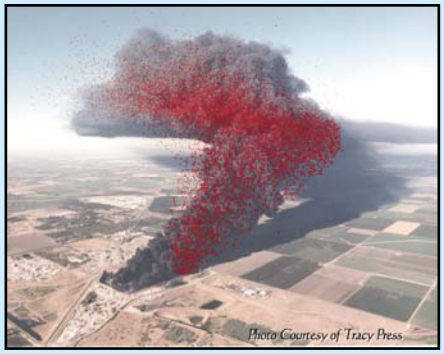
NARAC / IMAAC responds to over 8000 requests each year, including 100 major exercises, and 25 real-world incidents and alerts requiring LLNL technical and scientific staff support. The center currently supports over 1800 individual users from 300 federal, state, and local agencies.

NARAC serves as the DOE/NNSA Emergency Operations modeling center for nuclear incident response, working in collaboration with other assets including the Accident Response Group (ARG), Aerial Measuring System (AMS), Consequence Management Home Team, Joint Technical Operations Team (JTOT), Nuclear / Radiological Advisory Team (NRAT), Radiological Assistance Program (RAP), Radiation Emergency Assistance Center (REAC), and the interagency Federal Radiological Monitoring and Assessment Center (FRMAC). DOE/NNSA requires connectivity to NARAC by all DOE facilities with the potential for off-site consequences.

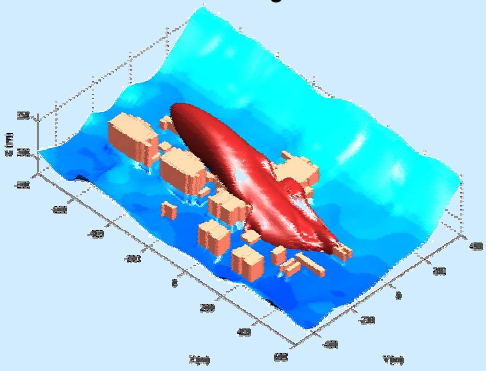
NARAC supports the DOE/NNSA's International Emergency Management and Cooperation (IEMC) Program, whose mission is to strengthen worldwide emergency preparedness and to develop capabilities to respond to international nuclear accidents. The DOE/DoD Naval Nuclear Propulsion Program (NNPP) utilizes NARAC for emergency planning and response for its sites.

NARAC supports radiological contingency planning for NASA space launches involving radioactive material, such as the Pluto New Horizons and the Mars Science Laboratory missions. The center also provides planning and emergency response services to US Government Operations Centers in the National Capitol Region.

NARAC / IMAAC provides predictions and analyses for real-world events (such as the fire below), National Security Special Events, and the National Exercise Program.



NARAC / IMAAC conducts research and development on new tools and capabilities. The example below shows dense gas dispersion modeling in a complex setting involving interactions with terrain and buildings.



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Under IMAAC auspices, LLNL supports the DHS National Operations Center (NOC), FEMA's National Response Coordinating Center (NRCC) and Regional Response Coordinating Centers (RRCCs), as well as IMAAC agency stakeholders from DHS, DoD, DOE, EPA, HHS, NASA, NOAA, and the Nuclear Regulatory Commission. A national deployment plan is underway to provide IMAAC capabilities to state and local agencies via the regional emergency response assets of IMAAC agencies. In addition, IMAAC supports five collaborating pilot cities and their regional partners, who have demonstrated the utility and value of access to the center's capabilities and services as part of local emergency response procedures.

TOOLS AND SERVICES

NARAC / IMAAC maintains a distributed modeling system, which provides airborne plume modeling and geographical information tools for deployment to an end user's computer system as well as real-time access to an advanced suite of three-dimensional models from the national center. This system includes extensive global geographical and real-time meteorological databases to support model calculations.

Initial predictions using NARAC / IMAAC software tools are available in less than a minute using only the end user's computer. This same software allows access to fully-automated three-dimensional plume model predictions in 5 to 15 minutes. The NARAC / IMAAC Web portal allows users to run their own simulations, obtain expert analyses from the center, and share model predictions with other users.

NARAC / IMAAC provides 24/7 technical and scientific subject matter expertise until all airborne releases end, the hazardous areas are defined and mapped, and the long-term impacts are assessed. Staff quality assure model input data, meteorological observations, weather and dispersion predictions, estimate unknown source amounts, and refine simulations based on field measurement data.

RESEARCH AND DEVELOPMENT

The center conducts cutting-edge research in strategically important areas of airborne transport and fate. This includes participation in urban field experiments and the development of transport and fate simulation capabilities. Some topics of current interest include urban flow and dispersion, indoor exposures, event reconstruction (data-driven simulation for characterizing unknown airborne sources and refining predictions), dense gas dispersion physics, nuclear fallout, chemical / biological / nuclear / radiological source characteristics models, boundary-layer meteorology and atmospheric turbulence.

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